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## United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Farm Management Investigations,

WASHINGTON, D. C.

THE WILD ONION.<sup>a</sup>

## INTRODUCTION.

The wild onion (*Allium vineale*), often called garlic, first makes its appearance in the early fall, continues green throughout the winter, and takes on renewed growth during the first warm days in spring. In pastures it is usually several weeks ahead of the first grasses. The onion matures about the same time as wheat, varying, of course, like wheat, in actual date of maturity, corresponding with the latitude in which it is grown. The plant reaches a height of  $2\frac{1}{2}$  to  $3\frac{1}{2}$  feet, and on top of the stem is formed a little cluster of aerial bulblets (fig. 1).



FIG. 1.—Aerial bulblets of wild onion.

These are about the size, shape, and weight of a grain of wheat and are harvested with the wheat, going through the fans and sieves of the thrasher with the wheat grains.

<sup>a</sup> This circular covers a preliminary report of the wild onion work of the Office of Farm Management Investigations. These investigations are still in progress, and later it is hoped to issue a bulletin giving full experimental data, as well as a more complete discussion of the life history and distribution of this (*vineale*) and other closely allied members of the *Allium*, or wild onion, family.

The object of publishing this matter in circular form at this time is to get at once before persons interested the information already in hand for their benefit and in the hope that the publication of these facts will assist this office in obtaining further data.



### DISTRIBUTION.

The general distribution of the wild onion on the Atlantic coast may probably be attributed to the fact that small-grain growers have not been careful to sow clean seed, and have consequently sown their fields with this pest.<sup>a</sup> Of course where the plant is allowed to mature in waste places the aerial bulblets are naturally distributed for some distance. If it be on a hillside with considerable slope, the rains may wash down the bulblets and lodge them anywhere along the way until the lowest level is reached. On level lands the natural range of distribution would be much shorter, probably confined to a few feet immediately surrounding the plant. The aerial bulblets are practically the only means by which the plant is carried from one farm to another.



FIG. 2.—Underground portion of wild onion at maturity.

### BULB-FORMING HABITS.

Figure 2 shows the underground portion of the onion as it appears at maturity. This portion contains from two to six newly formed bulbs. These bulbs are formed in the axis of each layer of the old bulb. The old plant—that is, the stem and the leaves—then dies away during the summer, leaving these new bulbs to start the growth of another season. Figure 3 shows the same plant with all the leaves (layers of the bulb) carefully removed, exposing the four bulbs which this plant has produced. The small detached bulb was broken off from the little black spot at the base of the large bulb.

It will be noticed in this illustration (fig. 3) that three of these bulbs are small, while the one immediately adjoining the stem is much larger. This large bulb differs from the small ones in several important particulars. It has a very thin, delicate skin, such as is seen on ordinary garden onions. The smaller ones have extremely hard, tough, brown shells around them. The wild onion plant that first makes its appearance above the ground in the fall comes from the large bulb. The smaller bulbs, which have the hard shell, usually do not start to grow until the following spring. It has been found that no matter how large a number of bulbs may be produced in a

<sup>a</sup> See Bulletin 100, Part III, Bureau of Plant Industry, entitled "Garlicky Wheat," for a description of a method of removing onion bulblets from small grain.



single plant there is always one, and only one, which has this soft shell and always germinates in the fall. In the more northern latitudes the others wait until very early spring before they begin growth. Farther south a few start growth in early winter.

In figure 4 is shown a photograph of a cluster of wild onions pulled from a lawn in Washington, D. C., in January, 1908. In figure 5 this same cluster is shown again. The plants and bulbs have all been separated from the dirt, and the plants from the soft-shelled bulbs are shown on the left. Every one of these soft-shelled bulbs has germinated and the plants have made considerable growth. In the center of the illustration (fig. 5) are shown a few hard-shelled bulbs which had just begun to grow because of a few days of warm weather in January, and on the right are shown the remaining hard-shelled bulbs, which had not yet started to grow.

It has been found that before all of the hard-shelled bulbs have germinated, plants from the soft-shelled ones have advanced far enough toward maturity to produce new bulbs. This seems to be the great secret of the remarkable vitality of the wild onion plant, to wit, that it has two kinds of bulbs, one germinating in the early fall and the other in the spring; and, further, before all the spring bulbs have germinated the plant from the fall bulb has already split up and formed new ones; consequently, there is no one period at which the plant can be completely killed by any ordinary treatment.

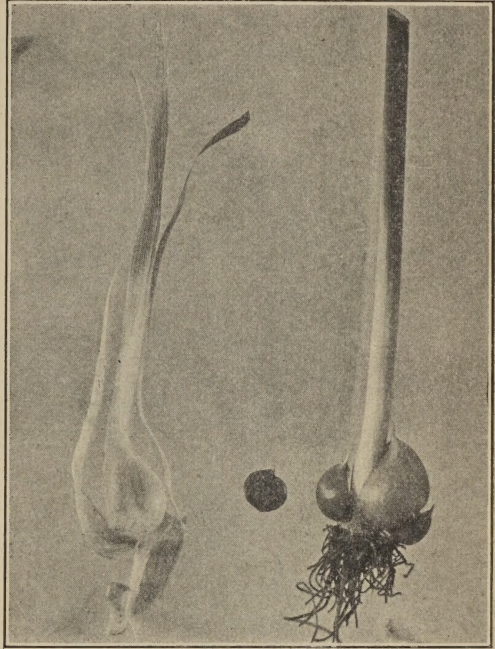


FIG. 3.—Underground portion of wild onion with all the leaves (layers of bulb) removed, showing the four bulbs which this plant has produced.

#### CULTURAL METHODS OF ERADICATION.

It becomes apparent, then, that to kill the wild onion the work must be begun in the fall in order to destroy the plant from the soft-shelled bulb before it has become sufficiently matured to produce new bulbs. There is a considerable period after the growth starts in the autumn during which the plant is susceptible to treatment. Theoret-



ically, the ideal time would be to attack the plant after the material stored in the bulb has become changed into the growing plant and before the beginning of the formation of new bulbs. With the average-sized onion this old bulb has been found to be practically exhausted when the plants are about 12 to 15 inches high. This state of growth is reached at different times, varying from the middle of September for the more southern latitudes to the middle of October for the northern part of the onion belt. The plant does not begin to form the new bulbs until about Christmas (later in the North). This makes quite an interval during the late autumn when the plants growing



FIG. 4.—Cluster of wild onions pulled from a lawn in Washington, D. C., in January.

from these large soft-shelled bulbs can be readily killed. Deep plowing in the autumn is by far the most satisfactory method of destruction. It has been found by experiment that if the green plant is buried 7 inches deep it will not grow out again.

In the *Memoirs of the Philadelphia Society for Promoting Agriculture*, volume 1, published in the year 1815, is given an account of a method of plowing called "trench plowing," which was said to completely kill the onions. Two plows were used in breaking the land by this method. The first plow cut about 3 inches deep; the second plow came in the same furrow and went to a depth of 10 inches.

The shallow running plow on the next round turned the first 3 inches of sod, which contained practically all of the onions, into the deep furrow left by the deeper running plow, and the deeper plow followed, completely burying the plants so that they did not show again. This plowing was done in the fall.

Any deep fall plowing would be satisfactory treatment for killing these plants from the soft-shelled bulbs. The efficiency of the fall plowing would be very much increased if the land were harrowed with a disk harrow so as to first cut off the tops of the onions, as the amount of material stored in the tops is often sufficient to help the plants to push out again after being buried with the plow.



Judge Richard Peters, in a discussion of the wild onion published in the Memoirs of the Philadelphia Society for Promoting Agriculture, 1811, says: "My experience for forty years has convinced me that the early plowing in the spring, and most especially if it succeeds the fall plowing, is the remedy." After deep fall plowing, the land should be broken again very early in the spring. This spring plowing should

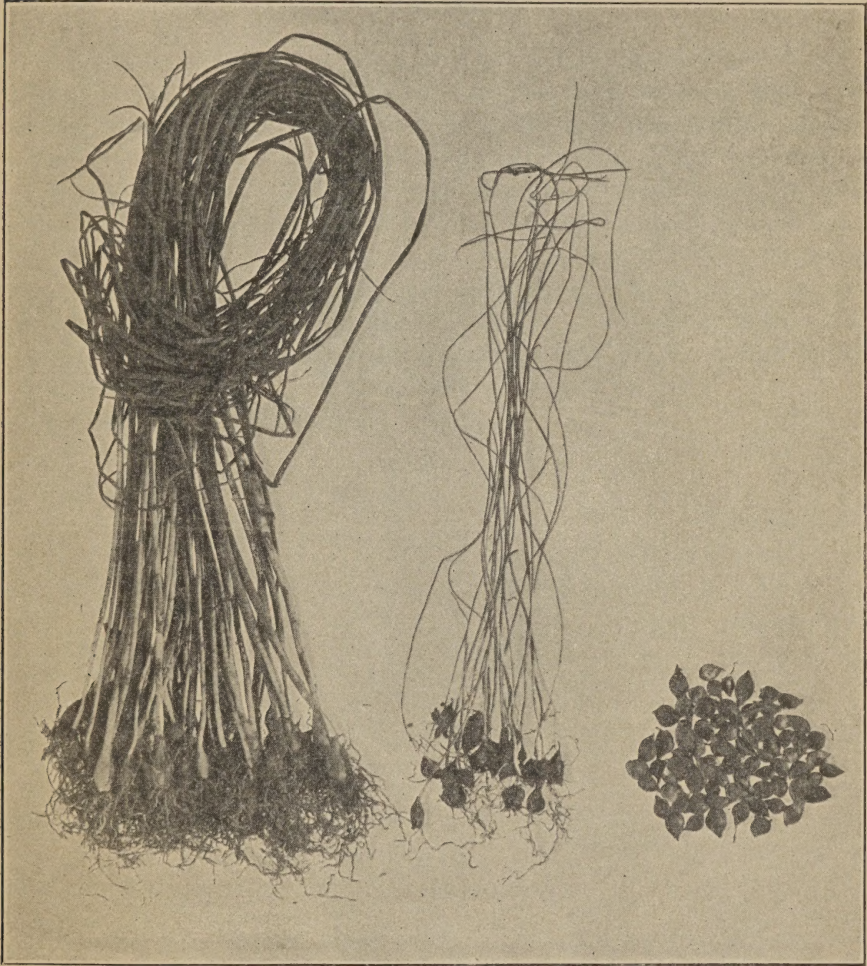


FIG. 5.—The same cluster shown in figure 4 with plants and bulbs separated, showing plants from soft-shelled bulbs and hard-shelled bulbs, and hard-shelled bulbs not yet germinated.

be shallow, so as not to turn up the bulbs already buried. Then if the ground is planted to a cultivated crop and this is given careful attention throughout the season, the wild onion should be brought under control, if not completely exterminated, in one season. In some cases it may be necessary to continue the treatment during a second season. The fact that the plant has two sorts of bulbs, with two periods for

germination, is the basic principle of its vitality. By attacking the plant after each germinating period it should be killed out.

The aerial bulblets (fig. 1) germinate in the early fall just as the large soft-shelled ones do. These plants, however, are weak and very easily destroyed by plowing them under deeply after they have started to growing well, and there is no further trouble from this source.

#### SUMMARY.

To destroy wild onions, harrow with a disk in the fall when the onions are 1 foot or more high, and follow with deep plowing. "Trench plowing," previously described, should be very efficient, and has to recommend it the additional advantage that most of the hard-shelled bulbs are thus buried too deeply ever to get out. This treatment is to kill plants coming from soft-shelled bulbs and from aerial bulblets which have fallen on the ground.

Break again, shallow, early in spring, plant to a cultivated crop, and give careful cultivation. This is to kill the plants from the hard-shelled bulbs. When this is accomplished the pest is destroyed.

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